

REMARKS

This Amendment is in response to the Office Action mailed February 11, 2003. In the Office Action, claims 8-9 were rejected under 35 U.S.C. §102(e) and claims 2-7 and 10-12 were rejected under 35 U.S.C. §103(a). No claims have been amended.

I. REJECTIONS UNDER 35 U.S.C. § 102(e)

Claims 8-9 were rejected under 35 U.S.C. §102(e) as being anticipated by Vynne (U.S. Patent No. 5,960,081). Applicants respectfully maintain that a prima facie case of anticipation has not been met because Vynne does not teach, expressly or inherently, each and every element set forth in these claims. Applicants acknowledge that Vynne describes a *retrievable* watermark (Col. 2, line 57 of Vynne), but, as set forth on column 8, lines 10-35, Vynne does not teach or even suggest recovering the watermark within the first frame *through analysis of intensity differences between the first frame of the video sequence and a second frame of the video sequence* (See Claim 8). In fact, a completely different technique is utilized as described therein.

In addition, Vynne (column 2, lines 51-53) describes an encoding operation that involves generation of a binary pseudo-random sequence using a seed; however, this reference does not describe or even suggest computing a pseudo-random number sequence using the random number generator seed *prior to recovering the watermark* as set forth in claim 9. The teachings are directed to encoding, and not recovery.

In light of the foregoing, Applicants respectfully request that the §102(e) rejection of claims 8-9 be withdrawn.

II. REJECTION UNDER 35 U.S.C. § 103(a)

Claims 2-7 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tewfik (U.S. Patent No. 6,272,634) in view of Rhoads (U.S. Patent No. 5,768,426). Applicants respectfully disagree.

With respect to claim 6, Applicants respectfully submit that Tewfik describes a pseudo-random sequence acting as a watermark and being based on two random keys (one key dependent on the author of the host data, the other based on the host data). *See Abstract.* Rhoads (column 5, lines 47-49) describes embedding an N-bit value onto an entire signal through the addition of a very low amplitude encodation signal which has the look of pure noise.

Neither Tewfik nor Rhoads, alone or in combination, describes or suggests producing a watermark based on a multiplication of (1) an amplitude of a data block, (2) a secondary data set with each pixel having a predetermined signal value, and (3) a pseudo-random number sequence. For instance, the very low amplitude encodation signal is not equivalent to an amplitude of a data block as claimed. Rather, the encodation signal is merely attenuated down (i.e., low amplitude) to acceptable perceived noise levels as set forth in column 7, lines 18-26 of Rhoads. The watermark is not based on the amplitude itself. Also, as claimed, each pixel of the secondary has a predetermined signal value. The N-bit value does not have such configuration. Thus, a prima facie case of obviousness has not been established because all limitations of the claim have not been evaluated. *See In re Evanega*, 829 F.2d 1110, 4 U.S.P.Q.2d 1249 (Fed. Cir. 1987).

Based on the foregoing, Applicants respectfully request withdrawal of the §103(a) rejection.

Claims 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Vynne in view of Leighton (U.S. Patent No. 5,949,88). Applicants respectfully traverse the allegation that Vynne discloses a watermark that this retrievable by detecting a change between the first frame

and a subsequent second frame. *See paragraph 7 of the Office Action.* Rather, Vynne describes the embedding of a watermark within “change information”. *See column 2, lines 60-63 of Vynne.* There is no teaching or suggestion of retrieving the watermark by detecting change between frames. Therefore, based on this information alone, a prima facie case of obviousness has not be established.

In addition, the Examiner affirms that Vynne does not disclose “computing a sum of the differences between watermarked intensities...,” but alleges that Leighton discloses adding the difference between several frames with value generated randomly. *See paragraph 7 of the Office Action.* Applicants respectfully disagree. In contrast, Leighton teaches the generation of watermarks that are slight variations of a baseline watermark. These varied watermarks can be applied to different copies of a data file. *See column 2, lines 33-54 of Leighton.* Leighton does not describe or even suggest recovering a watermark in accordance with operations explicitly set forth in claims 10-12.

More specifically, based on the foregoing, Applicants respectfully submit that neither Vynne nor Leighton, alone or in combination, describe or suggest (i) computing a sum for products of differences between watermarked intensities of the first frame and the second frame of the video sequence and corresponding elements of the pseudo-random number sequence; or (ii) computing a products of a mean value for the differences between watermarked intensities of the first frame and the second frame of the video sequence and a sum of the pseudo-random number sequence; or (iii) subtracting the product of the mean value for the differences between watermarked intensities of the first frame and the second frame of the video sequence and the sum of the pseudo-random number sequence from the sum of products of the differences between watermarked intensities of the first frame and the second frame of the video sequence and the corresponding elements of the pseudo-random number sequence. Therefore, not only are dependent claims 10-12 allowable based on their dependency to claim 8, but also are allowable based on the subject matter claimed therein.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

No amendments have been made to the pending claims.

1. Cancelled.

2. (Previously Amended) The method of claim 6 further comprising:
repeatedly performing arithmetic operations on signal values associated with different
regions of the data set to produce a plurality of resultant signal values;
determining sign bits associated with the plurality of resultant signal values; and
providing the sign bits as the pseudo-random number sequence.

3. (Previously Amended) The method of claim 6, wherein the generating of the
pseudo-random number sequence comprises:
computing a mean signal value for a first region of the data set;
computing a mean signal value for a second region of the data set;
performing an arithmetic operation on the mean signal value of the first region and the
mean signal value of the second region to produce a resultant signal value;
determining a sign bit of the resultant signal value; and
providing the sign bit as a portion of the pseudo-random number sequence.

4. The method of claim 3, wherein the performing of the arithmetic operation
includes computing a difference between the mean signal value of the first region and the mean
signal value of the second region.

5. The method of claim 4, wherein each region of the data set includes a predefined
image within the frame.

6. (Previously Amended) A method for improving detection of a watermark,
comprising:

3 generating a pseudo-random sequence of numbers based on data associated with a data
4 set;

5 producing the watermark by (i) computing a data block having an amplitude, (ii)
6 computing a secondary data set, each pixel of the secondary data set having a predetermined
7 signal value, and (iii) multiplying the pseudo-random number sequence, the amplitude and the
8 secondary data set to produce a result operating as the watermark; and
9 embedding the watermark into the data set.

1 7. The method of claim 6, wherein the amplitude for the watermark is computed
2 through adjustment of a plurality of parameters including frame differences.

1 8. A method for extracting a watermark from a video sequence, comprising:
2 receiving the video sequence having a first frame embedded with a watermark; and
3 recovering the watermark within the first frame through analysis of intensity differences
4 between the first frame of the video sequence and a second frame of the video sequence.

1 9. The method of claim 8, wherein prior to recovering the watermark, the method
2 further comprises:
3 computing a pseudo-random number sequence using the random number generator seed.

1 10. The method of claim 9, wherein the recovering of the watermark includes:
2 computing a sum for products of (i) differences between watermarked intensities of the
3 first frame and the second frame of the video sequence and (ii) corresponding elements of the
4 pseudo-random number sequence.

1 11. The method of claim 10, wherein the recovering of the watermark further
2 includes:

3 computing a products of (i) a mean value for the differences between watermarked
4 intensities of the first frame and the second frame of the video sequence and (ii) a sum of the
5 pseudo-random number sequence.

1 12. The method of claim 11, wherein the recovering of the watermark further
2 includes:

3 subtracting (i) the product of the mean value for the differences between watermarked
4 intensities of the first frame and the second frame of the video sequence and the sum of the
5 pseudo-random number sequence from (ii) the sum of products of the differences between
6 watermarked intensities of the first frame and the second frame of the video sequence and the
7 corresponding elements of the pseudo-random number sequence.

1 13. Cancelled.

1 14. Cancelled.

1 15. Cancelled.

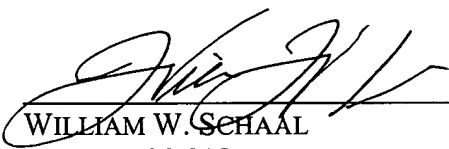
CONCLUSION

In view of the amendments and remarks made above, it is respectfully submitted that all pending claims are in condition for allowance, and such action is respectfully solicited.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: April 11, 2003

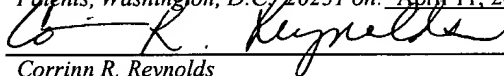


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CERTIFICATE OF MAILING

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Corinn R. Reynolds
4/11/03
Date